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| 09/884,659 | 06/19/2001 | Brian L. Hinman | PA1580US | 4480 |

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| EXAMINER | |
|---|---|
| WILLIAMS, LAWRENCE B | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2634 | 10 |

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/884,659 | HINMAN ET AL. | |
| | Examiner | Art Unit | |
| | Lawrence B Williams | 2634 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 June 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14 and 16-28* is/are rejected.

7)☒ Claim(s) *12-13, 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3,5
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 1- 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 cites the limitation "a first hybrid coupled to the local loop for receiving **downstream DSL signals** transmitted over the local loop, and for **differentially amplifying upstream** DSL signals, passing the **differentially amplified upstream** DSL signals to the local loop." This limitation appears to be in direct contrast/ conflict with applicant's claimed invention according to the disclosure. A further contrast/conflict appears in the limitation, " a downstream filter / amplifying equalizer coupled to the **first hybrid for amplifying the downstream frequency** band components of downstream DSL signals received by the first hybrid, **and attenuating the upstream frequency band** components of downstream DSL signals received by the first hybrid." According to these limitations applicant both amplifies and attenuates the upstream frequency band received by the first hybrid within the first hybrid. Examiner is unable

to find support in the specification for amplifying means with the hybrid. Examiner suggests applicant thoroughly review claims and rewrite to clarify claimed invention according to the specification as written.

Accordingly, the claims 1-8 have not been further treated on the merits.

4. Claims 16-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 16 cites the limitation "a differential amplifier pair coupled to the downstream filter / amplifying equalizer for receiving attenuated and amplified downstream DSL signals from the downstream filter / amplifying equalizer and for **further amplifying the attenuated and amplified** downstream DSL signals. " Examiner is unable to find support or reasoning as to why applicant amplifies both the "attenuated and amplified" signals.

Accordingly, the claims 1-8 have not been further treated on the merits.

## *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Evans et al. (US Patent 6,466,656 B1).

Evans et al. discloses in Figs. 7, 8, a device (92) for amplifying DSL signals on a local loop, the DSL signals having a downstream frequency band and an upstream frequency band, the device comprising: a downstream filter (104) / amplifying equalizer (108) coupled to the local loop for amplifying downstream frequency band DSL signals and for attenuating upstream frequency band DSL signals; and an upstream filter (102) / amplifying equalizer (106) coupled to the local loop for amplifying upstream frequency band DSL signals and for attenuating downstream frequency band DSL signals.

### *Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 10, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,466,656 B1) as applied to claim 9 above, and further in view of Mukherjee (US Patent 6,226,322 B1).

(1) With regard to claim 10, as noted above Evans et al. discloses all limitations of claim 9. He does not however disclose the device further comprising: a differential amplifier pair coupled to the downstream filter / amplifying equalizer for further amplifying downstream frequency band DSL signals received from the downstream filter / amplifying equalizer; and an

inverting amplifier coupled to the upstream filter / amplifying equalizer for inverting upstream frequency band DSL signals received from the upstream filter / amplifying equalizer.

However, Mukherjee teaches an analog receive equalizer for digital-subscriber-line communication systems in Fig. 13, comprising: a differential amplifier pair (110, 112) coupled to the downstream filter / amplifying equalizer for further amplifying downstream frequency band DSL signals received from the downstream filter / amplifying equalizer; and an inverting amplifier coupled to the upstream filter / amplifying equalizer for inverting upstream frequency band DSL signals received from the upstream filter / amplifying equalizer (abstract; col. 17, lines 43-52).

One skilled in the art would have clearly recognized that the use of a differential amplifier pair and an inverting amplifier for amplifying downstream DSL signals and an inverting amplifier for amplifying upstream DSL signals, respectively is a well-known technique introduced in many references. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Mukherjee to modify the invention of Evans et al. as differential amplifiers are known to give 50dB or more common mode rejection with reduced distortion and are widely used for data transmission along networks and as a method of overcoming the effects of line attenuation.

(2) With regard to claim 11, Mukherjee also discloses a first hybrid (98) coupled to the downstream filter / amplifying equalizer, the inverting amplifier, and the upstream filter / amplifying equalizer for coupling the downstream filter / amplifying equalizer, the inverting amplifier, and the upstream filter / amplifying equalizer to the local loop; and a second hybrid (100) coupled to the upstream filter / amplifying equalizer and the differential amplifier pair for

coupling the upstream filter / amplifying equalizer and the differential amplifier pair to the local loop.

(3) With regard to claim 14, Evans et al. also discloses wherein the downstream filter / amplifying equalizer is configured to amplify higher frequency components of the downstream frequency band DSL signals more than lower frequency components of the downstream frequency band DSL signals, and the upstream filter / amplifying equalizer is configured to amplify higher frequency components of the upstream frequency band DSL signals more than lower frequency components of the upstream frequency band DSL signals (col. 16, lines 4-24).

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,466,656 B1) in view of Mukherjee (US Patent 6,226,322 B1).

Evans et al. discloses in Figs. 7, 8, a method for improving DSL service over a local loop, comprising: coupling a first loop extender (92) to the local loop between a central office and a customer premises; and employing the first loop extender to amplify upstream and downstream DSL signals passing over the local loop to at least partially compensate for DSL signal attenuation caused by the DSL signals passing over the local loop.

Evans et al. is silent however to differentially amplify the upstream and downstream DSL signals.

However, Mukherjee teaches in Fig. 7, differentially amplifying (90) DSL signals to boost signal amplitude to overcome the effects of line attenuation (abstract; col. 17, lines 43-52).

One skilled in the art would have clearly recognized that differentially amplifying

upstream and downstream DSL signals is a well-known technique introduced in many references. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Mukherjee to modify the invention of Evans et al. as differential amplifiers are known to give 50dB or more common mode rejection with reduced distortion and are widely used for data transmission along networks.

10. Claims 23, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,466,656 B1) in combination with Mukherjee (US Patent 6,226,322 B1) as applied to claim 22 above, and further in view of Bardutz et al. (US Patent 4,766606).

(1) With regard to claim 23, as noted above, Evans et al. in combination with Mukherjee disclose all limitations of claim 22. They do not however disclose coupling a second loop extender to the local loop between the central office and a customer premises, the first and second loop extenders being disposed in series with each other and separated by a distance; and employing the second loop extender to differentially amplify upstream and downstream DSL signals passing over the local loop to at least partially compensate for DSL signal attenuation caused by the DSL signals passing over the local loop.

However, Bardutz et al teaches multiple loop extenders in Fig. 1 disposed between a central office and a subscriber. One skilled in the art would clearly recognize that multiple loop extenders dispose between a central office and subscribers are well known in the art. It would have been obvious to use a second or more of these extenders to simply extending the range of digital data signals.

(2) With regard to claim 24, though neither of the above references make a particular reference to the distance between a first and second extender, it would simply be a matter of design choice to coincide with the ability of the designed extender.

11. Claim 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,466,656 B1) in view of Mukherjee (US Patent 6,226,322 B1).

(1) With regard to claim 25, Evans et al. discloses in Figs. 7, 8, a method for improving DSL service over a local loop, comprising: receiving an upstream DSL signal from a customer premises; filtering the upstream DSL signal to attenuate signals outside an upstream DSL signal frequency band; amplifying the filtered upstream DSL signal to at least partially compensate for upstream DSL signal attenuation caused by the upstream DSL signal passing over the local loop.

However, differentially amplifying the amplified upstream DSL signal to further compensate for upstream DSL signal attenuation caused by the upstream DSL signal passing over the local loop; and passing the differentially amplified upstream DSL signal onto the local loop for transmission to a central office.

However, Mukherjee teaches in Fig. 7, differentially amplifying (90) DSL signals to boost signal amplitude to overcome the effects of line attenuation (abstract; col. 17, lines 43-52).

One skilled in the art would have clearly recognized that differentially amplifying upstream and downstream DSL signals is a well-known technique introduced in many references. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Mukherjee to modify the invention of Evans et al. as

differential amplifiers are known to give 50dB or more common mode rejection with reduced distortion and are widely used for data transmission along networks.

(2) With regard to claim 26, claim 26 inherits the limitations of claim 25, above.

(3) With regard to claim 27, claim 27 inherits the limitations of claims 25 and 26, above.

(4) With regard to claim 28, claim 28 inherits the limitations of claims 25-27, above.

### *Allowable Subject Matter*

12. Claims 12, 13, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 703-305-6969. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
July 6, 2004

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